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Development status of beam diagnostic devices for Korea-4GSR project and PLS-II

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The Korea-4GSR project is a green-field project which was launched to build a diffraction-limited light source. The accelerator is aimed to achieve an emittance of less than 100 pm-rad with a kinetic energy of 4 GeV and a circumference of 800 m. Various beam diagnostics with a few micrometer spatial and picoseconds temporal resolutions are necessary to verify the beam quality. It contains a visible interferometric beam size monitor, gas photon position monitor, beam loss monitor, and bunch length monitor. The visible interferometric beam size monitor is newly developed to deconvolute ground motion by using a high-speed data acquisition and processing system. A gas-based photon beam position monitor, which is demanded to observe photon position at the front end of the beamline, is simulated to estimate position accuracy. The optical fiber-based beam loss monitor is designed, fabricated, and tested to confirm particle losses at different sections during beam injection.

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